UNIVERSITY OF TASMANIA

Helping Those Who Help Us: Examining the Effect of Mental Training Programs on Resilience in First Responders

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A report submitted as a partial requirement for the degree of Bachelor of Psychological Science with Honours in Psychology at the University of Tasmania, 2019.

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Statement of Sources

I declare that this is my own original work and that contributions of others have been duly acknowledged

Date: 25.10.19

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Acknowledgements

I would not have survived this year without my two incredible and talented supervisors Dr. Kimberley Norris and Dr. Crystal Meehan. I am very grateful to them for embracing my dramatics and helping me to navigate the setbacks I have experienced this year. It is no secret how much I admire Kim's research and approach to education, and to collaborate with her for this study was a brilliant (albeit very hectic) experience that I am very thankful for.

I would also like to thank my partner Zachary for his unwavering support, motivating words and for keeping our wine cellar stocked throughout the year. Special thanks also go to all our foster dogs who gave me their unconditional love and made 2019 inexplicably brighter.

Finally, my warmest gratitude extends to those participants from Tasmania Police and Tasmania State Emergency Service, Cameron Blight from Department of Police, Fire and Emergency Management, Matthew Richman from Tasmania Police and Andrew Lea from Tasmania State Emergency Service. This research would not be possible without their assistance and support. First responders are a cohort providing a vital service to the community and their wellbeing should remain a paramount focus of research.

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Helping Those Who Help Us: Examining the Effect of Mental Training Programs on Resilience in First Responders

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Word Count: 9893

Abstract

First responders are exposed to significant physical, psychological and social stressors and present with higher levels of negative outcomes such as depression, anxiety and post-traumatic stress than the general population. Therefore, identifying predictors of health is paramount to preserve their wellbeing. This research implemented two brief mental training programs (mindfulness and self-reflection training) and examined their effect on psychological outcomes. A sample of police officers and state emergency service personnel (*N*=18) completed a baseline survey measuring resilience, depression, anxiety, job satisfaction and mindfulness. Participants were randomly allocated to a mindfulness or self-reflection group and completed mental trainings over a four-week period. Six participants completed a follow-up survey with no significant differences found between pre and post-training measures of resilience, anxiety, job satisfaction or mindfulness. There was a main effect of time on depression, suggesting that engaging in mental training was effective in reducing depressive symptoms irrespective of the training type. The results of this study suggest a role for mental training programs in improving depressive symptoms, and demonstrate the need for tailored interventions to be developed that overcome the unique practical and cultural barriers faced by first responders that may otherwise impede optimal enhance mental health and wellbeing outcomes.

Frontline emergency service personnel (also known as first responders) are among the first on the scene of an accident or emergency. The four major emergency service bodies in Australia are the police, fire, ambulance and state emergency services. Personnel in these services are expected to meet physical, emotional and psychological demands in the context of their profession that are higher than that of the general working population (Shakespeare-Finch & Daley, 2017).

First responders are exposed to both common and unique occupational stressors. Work-related stressors experienced by first responders common to many occupations include long hours, shift work and regular unpaid overtime (Barratt, Stephens & Palmer, 2018). However, Van der Ploeg and Kleber (2003) found chronic work stressors such as poor communication from management, insufficient financial reward and inadequate support from colleagues and supervisors to be reported at significantly higher rates in first responder populations than a healthcare reference group. Organisational stressors such as these are further compounded by the chronic and repeated exposure to potentially traumatic events, characterised by threat of death and suffering to themselves and those they are working to protect (Barratt et al., 2018).

Exposure to Potentially Traumatic Events

In Australia, it is estimated that 75% of the general population will be exposed to one or more potentially traumatic event (PTE) in their lifetime (Phoenix Australia, 2017). The events that can be categorised as PTEs are heterogeneous in nature, often manifested as threatening to life or the physical, emotional or mental health of an individual (Meyer et al., 2012). This definition encompasses the different modalities that traumatic events can be experienced, as outlined by the Diagnostic and Statistical

Manual of Mental Disorders Fifth Edition (DSM-5; American Psychiatric Association, 2013). These include directly and indirectly experiencing or witnessing the event, or exposure to the event through professional duties. The nature of PTEs faced by first responders varies substantially, due to the extensive variation in professional duties performed by each occupation.

In the line of duty, first responders are regularly exposed to PTEs such as large-scale emergencies (e.g. aftermath of a natural disaster) and life-threatening situations (e.g. car accident). PTEs faced by paramedic personnel include repeated exposure to serious injury, pain and death of others (Austin, Pathak & Thompson, 2018). Those in the police force can be required to injure and take the life of individuals posing threat to themselves and the community (Komarovskaya et al., 2011). Firefighters work in hazardous environments that threaten both the safety of the community as well as the fire service personnel themselves (Meyer et al., 2012).

The outcomes following exposure to PTEs are also characterised by diversity. Bonanno, Westphal and Mancini (2010) identified four main trajectories following potential trauma. These include resilience, recovery, chronic and delayed dysfunction (Figure 1). Individuals displaying a resilient trajectory following PTE exposure experience mild post-traumatic stress (PTS) symptoms that spontaneously resolve within weeks, resulting in little to no functional impairment to the individual. A recovery trajectory is characterised by moderate PTS symptoms that impair functioning for a longer period before subsiding. Chronic trajectories display significant PTS symptoms that persist without subsiding and can impair the individual for years following PTE exposure. Delayed trajectories begin with moderate PTS symptoms that increase in

severity over time. Resilience is the most common trajectory following PTE exposure (Bonanno et al., 2010). This indicates resilience is a normal process by which individuals process and integrate potentially traumatic experiences within existing schema.

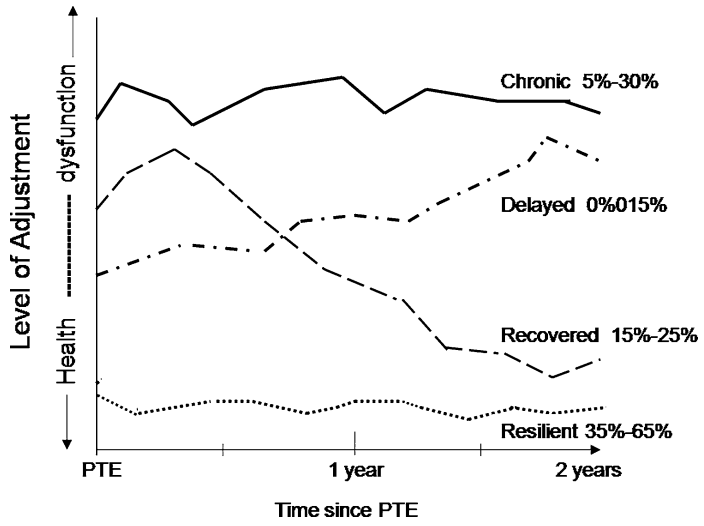

Figure 1. Outcome trajectories following exposure to potentially traumatic events (Bonanno et al., 2010).

However, a resilience trajectory can be inhibited by repeated exposure to PTEs (Bonanno et al., 2010). A dose-response effect of PTE exposure on psychological outcomes has been demonstrated with greater PTE exposure linked to poorer outcomes (Harvey et al., 2016). In a cohort of Australian firefighters, Harvey and colleagues (2016) found a positive linear relationship between attendance at events involving a fatality and negative outcomes (Figure 2).

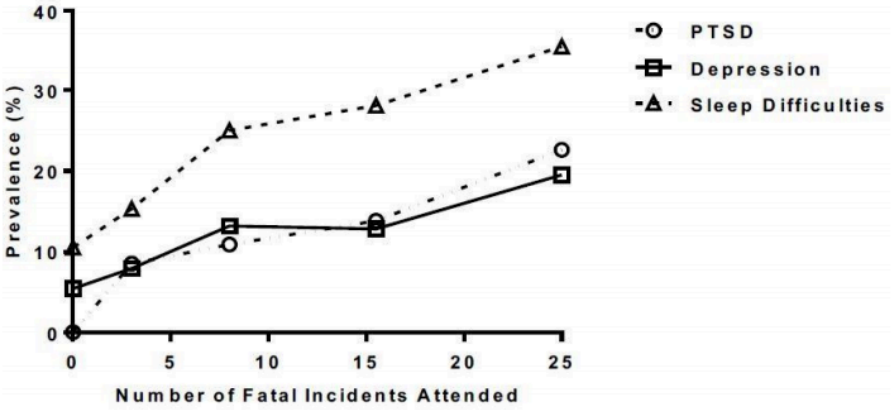

Figure 2. The impact of cumulative trauma exposure on symptoms of PTSD, depression and sleep difficulties (Harvey et al., 2016).

Repeated trauma exposure can create a state of cognitive overload, leading to a situation where individuals exposed to PTEs cannot effectively process and integrate future events into existing schemas and instead create new schemas focused on threat and danger (Bower & Sivers, 1998). This hyper-vigilance to threat places first responders at a higher risk for debilitating outcomes, characterised by persistent PTS symptoms including depression, anxiety, burnout, substance abuse and suicidality (Gayton & Lovell, 2012). Beyond Blue (2018) reported 33% of Australian first responders experience high or very high psychological distress and are twice as likely to experience suicidal thoughts than the general population.

Underrepresentation in research

Emergency service personnel are a demographic greatly underrepresented in research (Haugen, Evces & Weiss, 2012). This is surprising given the risks to psychological wellbeing that are known to accompany this occupational sector. The majority of research examining chronic organisational exposure to PTEs is in a military

context; subsequently most prevention and intervention programs have been designed and implemented for the defence force. Although first-responder and military populations share some similarities (i.e. PTE exposure, stigma against mental health discourse and help-seeking; Haugen et al., 2012; Sharp et al., 2015), they vary dramatically in others. The two groups have vastly different practices, protocols and principles underpinning workplace operations and engagements with prevention and intervention. Additionally, although PTE exposure is greater in the first responder population there are no comprehensive health management systems in place for members, such as those seen in the military (Scarr, 2015). Additionally, in a meta-analysis of mental health interventions available to first responders, it was concluded that none had a significant effect on personnel outcomes (Patterson, Chung & Swan, 2014).

Salutogenesis

Research investigating PTE exposure and outcomes for first responders has almost exclusively been in a pathogenic paradigm (Barratt et al., 2018). Pathogenic frameworks aim to improve health and wellbeing by focusing on disease or negative outcomes and working retroactively to identify risk factors causing the problem and eliminate them (Becker, Glascoff & Felts, 2010). This framework is incompatible with research examining first responders for two reasons. First, the risk factors (i.e. PTE exposure; high physical, emotional and psychological demands) associated with negative outcomes are inherent in the occupation and cannot be avoided in an effort to enhance first responder health. Second, pathogenic models neglect the positive outcomes that can occur for personnel, which is particularly problematic considering positive

outcomes have been demonstrated to occur more frequently than negative symptoms in the first responder population (Shakespeare-Finch et al., 2003).

An alternative approach to first responder health and wellbeing is to focus on salutogenic factors such as resilience and social support (Shakespeare-Finch, 2007). Unlike pathogenic models, salutogenesis focuses on the origins of health and aims to enhance existing wellbeing rather than simply remediating illness (Antonovsky, 1996). Whilst still appreciating the occurrence of negative post-trauma outcomes, salutogenic models identify predictors and strategies to foster the health of personnel despite the adversities faced in their professional role. This approach emphasises proactive prevention to foster a healthy and sustainable workforce. Shifting research focus to preserving wellbeing also reduces stigma around mental health discourse and supports maintenance of wellbeing in first responders (Barratt et al., 2018). Strength-building interventions aimed at building capacity to navigate PTEs are argued to be more effective than reactive clinical therapies as personnel are hesitant to engage with a problem-focused (pathogenic) intervention that requires them to self-identify as having a mental health issue (Grupe et al., 2019).

Resilience

The frequency of PTE exposure and severity of potential outcomes in first responders highlights the need for promotion of protective factors such as resilience in this population. The definition of resilience is a topic of debate, with different definitions being used for varying research contexts, aims and methodology (McClearly & Figley, 2017). Graber and colleagues (2015) argue that differing definitions of resilience do not inhibit the reliability or validity of resilience research, provided the definition adopted is

consistent with the measures used (Herrman et al., 2011). Specific conceptualisations define resilience as a personality trait (Graber et al., 2015), positive outcome following adversity (McCleary & Figley, 2017), buffer between hardship and negative outcomes (Helmreich et al., 2017) and process of returning to normal functioning following exposure to adversity (Rutter, 1990). Despite debate regarding specific mechanisms of resilience, Luthar's (2006) two requirements of significant adversity and positive adaptation under challenging circumstances are almost universally accepted. Resilience dictates how individuals respond, both immediately and long-term, to adversities such as PTEs (Bowen, 2011). For the purposes of this research, resilience is conceptualised as the process of using one's emotional, psychological, physical and cognitive stores to navigate adversity and promote positive adaptation (Paton et al., 2012). Resilience has been demonstrated as a strong predictor of mental health following trauma exposure, with highly resilient individuals developing fewer negative psychological outcomes and returning to normal functioning at a faster rate (Bowen, 2011).

Measuring resilience

Similar to its definition, there is little agreement over how to best operationalise and measure resilience (Graber et al., 2015). Methods of measurement are heterogeneous, reflected in the diverse range of outcomes and conclusions drawn in resilience literature. One method of quantifying resilience is by inference from scores on secondary outcome measures such as depression, anxiety and post-traumatic stress scales (Herrman et al., 2011), with lower scores indicating higher resilience. Job satisfaction has also been found a reliable proxy measure of resilience, with higher job satisfaction indicating higher levels of resilience (Paton et al., 2008). More recently,

primary outcome scales such as the Resilience Scale for Adults (RSA; Friborg et al., 2003) have been developed in response to the lack of a dominant and generalizable psychometric tool available to quantify resilience. The RSA incorporates both interpersonal and intrapersonal factors that predict resilience and foster adaptive outcomes. These include dispositional aspects such as attitudes and beliefs, measured by the RSA subscales of personal strength and structured style. A large body of research has highlighted the role of social support in fostering positive outcomes following exposure to PTEs (Prati & Pietrantoni, 2010). As such, the scale also measures an individual's availability of social supports and ease of activating these support systems via the subscales of social competence, family cohesion and social resources.

Resilience training programs

Resilience training programs (RTPs) aim to enhance navigation of adversity through fostering qualities that support wellbeing (Leppin et al., 2014). These programs are vastly diverse in their conceptualisation of resilience, program content, length of training and modality of administration (Joyce et al., 2018b). Programs have been developed for administration to the general population (Rose et al., 2013) as well as specific target populations (Kaplan et al., 2017), and vary in stressor type targeted (trauma-induced vs. general daily stressors; Leppin et al., 2014). In a meta-analysis, Crane and colleagues (2019) found most RTPs used a combined approach of psychoeducation and guided practice of skill development followed by rehearsal of the skills learned. The skills targeted within RTPs include variables that have been found to mediate the relationship between adversity and adaptive functioning, including cognitive flexibility, active coping and positive emotions (Leppin et al., 2014).

Barriers to resilience training

Historically, a cultural resistance toward mental ill-health and support seeking has permeated the emergency services sector (Moffitt, Bostock & Cave, 2014). Beyond Blue (2018) found that after recognising mental health support was needed, one in five first responders failed to seek any form of support, reporting they preferred to deal with the issue outside of work. Common reasons cited for this lack of support seeking included concern of being removed from their occupational role, negative impacts on their career and being perceived as weak for vocalising mental health struggles. Haugen and colleagues (2017) highlighted personnel concerns with confidentiality of both proactive and reactive mental health support services, finding first responders believe support services are strongly and negatively linked to management and career development opportunities. This suggests that in contrast to reactive pathogenic interventions focused on mental ill-health, resilience training programs may be more acceptable to the first-responder cohort and personnel engagement may be enhanced when able to be self-administered and preserve anonymity and confidentiality.

A further barrier to first responders engaging with mental health supports such as resilience training pertains to personnel remaining unaware of their personal need for support. Beyond Blue (2018) found 15% of personnel who scored high or very high distress levels did not feel they had a mental or emotional health issue. Increased mental health literacy can help personnel identify their own need for support as well as identify when their colleagues require support. Further, enhanced mental health literacy can help foster a culture of normalised mental health promotion and mental health dialogue

characterised by openness rather than fear (Beyond Blue, 2018), and in doing so promote a salutogenic approach to health and wellbeing in this population.

Although resilience training programs such as those mentioned above have been demonstrated as effective in increasing positive outcomes for populations at high risk of negative psychological symptoms, they also present several practical barriers that diminish their suitability for the first responder population. Resilience training is often delivered in a face-to-face format over an extended period of time (Crane et al., 2019). This format poses a challenge for the first responder demographic in several ways. Firstly, the population is widely dispersed geographically across urban, regional and rural areas of Australia. Administration of this type of resilience training to all personnel would be both expensive and impossible in some areas. Secondly, first responders are often time-poor (Joyce et al., 2018a), deeming extensive training a burden on their personal lives as well as disruption of critical emergency operations. Thirdly, the flexible nature of emergency service work demands training that is equally as adaptable. Scheduling lengthy training sessions at set times is unrealistic given the unpredictable schedule of emergency service personnel. These cultural (i.e. stigma) and practical (i.e. time, geography and workflow) obstacles indicate training is needed that is confidential, self-directed, brief, and able to be administered to personnel working in rural and remote areas.

Implications of employing effective resilience training programs

Presently, resilience training programs tailored to first responders are lacking (Kleim & Westphal, 2011). Given that the large majority of first responders will be exposed to multiple PTEs in their careers, knowledge of strategies to preserve their

health and wellbeing is paramount. The service provided by first responders is fundamental in preserving the health and safety of society, therefore it is crucial for personnel to be operating at optimal capacity for both their own benefit and that of the community. Psychologically impaired personnel can be prone to (potentially fatal) errors in occupational decision making (Sallis et al., 2013), hazardous work decisions for themselves and their colleagues (Angelo & Chambel, 2015) and aggression towards others (Rajaratnam et al., 2011). In a population particularly vulnerable to negative psychological outcomes, the resources required for preventative strategies such as RTPs can be viewed as a minimal cost in comparison to the potential negative consequences of trauma exposure to both first responders and those they serve (Kent, Davis & Reich, 2014).

Mindfulness training programs

The rising popularity of mindfulness as a therapeutic technique has seen mindfulness-based training programs, including mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT; Grupe et al., 2019), be developed and implemented for specific demographics and their needs (Pillay & Eagle 2019). Over recent years, mindfulness has been employed to promote resilience in high stress populations such as first responders (Thompson, Arknoff & Glass, 2011). Kaplan and colleagues (2017) implemented a mindfulness-based resilience training (MBRT) in a sample of police officers and fire fighters. The training consisted of 18 hours of face-to-face training in addition to homework assignments across an 8-week period. Participants reported an increase in mindfulness which was associated with an increase in resilience and decrease in occupational burnout. Mindfulness was concluded to be an

effective vehicle for fostering resilience and, by extension, reducing and preventing negative psychological symptoms in first responders. The resilience-promoting effects of mindfulness have also been demonstrated to include a reduction in recovery time following PTE exposure in first responders (Chopko, Palmieri & Adams, 2018). Boettcher and colleagues (2014) trialled an internet-based mindfulness program in participants who indicated mild anxiety symptoms or greater. Mindfulness training consisted of two hours of formal mindfulness training and encouraged homework practice of the skills learned each week for eight weeks. They found a decrease in symptoms of anxiety and depression compared to a control group, supporting the concept of internet-based mindfulness as an effective method for the reduction of negative symptoms.

Mindfulness dose-response relationship

Although the physical and psychological benefits of mindfulness training have been empirically established, there is little consensus regarding how much time is required engaging in the practice before these benefits become salient and enduring (Mellor et al., 2016). A central barrier to this knowledge is failure to ascertain participant adherence and engagement in mindfulness practice, both in and outside training sessions (Boettcher et al., 2014). Common mindfulness programs such as MBSR and MBCT can require over 30 hours of in-class training in addition to 30-60 minutes of individual daily practice (Carmody & Baer, 2009; Kabat-Zinn, 1990). This time commitment is often not feasible for time-poor demographics such as first responders. Minor and colleagues (2006) found the extensive time demands (45 minutes to one-hour daily practice) was a significant barrier that inhibited caregivers of

chronically ill children from participating in a MBSR program and induced a 10-15% attrition rate in the study. Additionally, it is inconclusive whether extensive practice time is imperative to elicit a response (Del Re et al., 2012). Shortened versions of the mindfulness training programs, ranging from six to 20 hours have been compared with no demonstrated relationship between training hours and training outcomes, suggesting extensive training sessions are not a vital criterion for eliciting positive benefits (Vøllestad et al., 2012; Carmody & Baer, 2009). The inconsistency in required dosage to elicit positive outcomes from mindfulness practice suggests more research is required to determine whether shorter versions of traditional mindfulness training can foster positive outcomes such as resilience.

Self-reflection

Grant and Kinman (2012) consider self-reflection as a means to psychologically process complex and stressful events. By doing so, the individual adapts and becomes more resilient towards forthcoming adversity and future performance is enhanced. Crane and Boga (2017) identify stressor exposure as a prerequisite for self-reflection that results in increased resilience as it provides an authentic platform for self-reflection to be practiced. This process of self-reflection has two adaptive outcomes. Responding to adversity with appropriate thoughts, emotions and behaviours fosters resilience against negative post-trauma outcomes and supports the likelihood of positive post-trauma outcomes, such as recovery and post-traumatic growth. Secondly, it encourages reappraisal of adversity as an opportunity for learning and resilience building, rather than purely a source of distress. This positive appraisal is particularly vital for those in

high risk population, such as first responders, where exposure to adversity is inevitable (Crane & Boga, 2017).

Self-reflection training (SRT) has only recently been implemented as a resilience training strategy for high risk populations, with only one empirical study identified in existing research literature. Crane and colleagues (2019) implemented SRT for 15 minutes per week across a 5-week period in a cohort of military officer cadets and found SRT reduced symptoms of depression, anxiety and perceived stressor frequency. These results were observed at a three-month follow up, suggesting the effects of SRT endure after formal training has ceased. Additionally, they noted the psychological trajectory of the cadets (who were exposed to substantial training-related adversity throughout the study) demonstrated resilience as evidenced by an initial increase in anxiety symptoms (after the stressor period) before an observed decrease in anxiety symptoms at a subsequent 3-month follow-up. This study provided initial support for self-reflection as an effective method for fostering resilience in a cohort exposed to significant stressors and a viable method of proactive prevention against commonly experienced negative outcomes including depression and anxiety.

The Present Study

First responders are a population particularly vulnerable to negative psychological outcomes due to the high risk of exposure to potentially traumatic events that is inherent in their work (Kleim & Westphal, 2011). Research and intervention aimed at preventing negative outcomes following exposure to potentially traumatic events has largely been overshadowed by research examining how to treat these outcomes retroactively (Austin et al., 2018; Shakespeare-Finch, 2007). Resilience has

been identified as a core predictor of positive outcomes following trauma exposure and therefore identifying strategies to foster resilience is paramount for high risk demographics (Gayton & Lovell, 2012). First responders face unique cultural (stigma) and practical barriers (geographical location, time constraints) preventing engagement with traditional resilience-promoting interventions. In order to effectively foster resilience and positive outcomes and minimise negative outcomes following exposure to PTEs, programs must be suited to the parameters of the population. Two strategies that have been linked to increased resilience and minimised negative outcomes are mindfulness (Kaplan et al., 2017) and self-reflection (Crane et al., 2019). Both programs can be tailored to be brief, online and self-administered to meet the parameters and overcome the resilience training barriers of the first responder population.

Therefore, the primary aim of the present study was to examine the effect of brief, self-directed mindfulness and self-reflection (mental training) programs on predictors of salutogenic outcomes (resilience) and pathogenic outcomes (depression, anxiety) in first responder populations. A secondary aim of the study was to examine differences in mental training efficacy between different first responder cohorts (police, ambulance, fire service, state emergency service). In accordance with the relevant literature, the study also aimed to explore whether brief durations of mental training can result in meaningful change in resilience, depression and anxiety. There is inconclusive evidence for the dose of mindfulness required to elicit effects and, given its novelty in a resilience training setting, there is currently very limited literature examining the dose-response relationship of self-reflection training. Therefore, the present study aimed to

examine if these two mental training methods could elicit effects when implemented for a short period of time.

These aims were supplemented by 3 hypotheses:

1) There would be an increase in resilience scores, as measured by the Resilience Scale for Adults, following completion of the mental training program (mindfulness and SRT)
2) Participants would report a reduction in pathogenic outcomes including depression, as measured by the Personal Health Questionnaire Depression 8-item Scale, and anxiety, as measured by the Generalised Anxiety Disorder 7-item Scale following completion of the mental training program (mindfulness and SRT)
3) Engagement with mental training (as measured by number of trainings completed and amount of daily practice outside of training) would positively predict resilience, and negatively predict depression and anxiety

Method

Participants

Through G*power calculations, it was determined that a minimum of 34 participants were required to achieve a moderate effect size (0.25) with a power level of 0.8 at α=.05. Ethical approval was provided by the Tasmanian Social Sciences Human Research Ethics Committee (#H0018034; Appendix A). Prerequisites for participating in the present study included age (>18 years) and profession (>1 years' experience as a first responder in the police, fire, ambulance or state emergency service). All first responder

populations (police, fire, ambulance, state emergency service) were invited to participate with the final participant pool spanning police and state emergency service (SES) personnel. Recruitment took place via liaising with the Department of Police, Fire and Emergency Management, Tasmania Police, Ambulance Tasmania and the Tasmanian State Emergency Service following approval from the Tasmanian Institute of Law Enforcement Studies (Appendix B). Study invitations included an advertisement with a brief description of the study and a web link to view a participant information sheet and complete the baseline survey online (Appendix D). The participant information sheet outlined the aims and method of the study, as well as potential risks and benefits for participating (Appendix E).

A total of 18 participants from across police and SES personnel took part in the pre-intervention stage of the study (Table 1).

Table 1

Baseline Survey Participant Gender, Age Range, Emergency Service Sector, Employment Type and Length of Employment

Participant Category (*N*= 18)	*N*	% of sample
Gender		
Male	13	72.2
Female	5	27.8
Age Range		
25-34	2	11.1
35-44	5	27.8
45-54	7	38.9
55+	4	22.2
Emergency Service Sector		
Tasmania Police	12	66.6
State Emergency Services	6	33.3
Employment Type		
Professional (Salaried)	13	72.2
Volunteer	5	27.8
Length of Employment (Years)		
1-5	2	11.1
6-10	4	22.2
11-15	3	16.7
16-20	2	11.1
21-25	4	22.2
26-30	-	-
30+	3	16.7

Table 2 details demographics for the six participants who completed the post-intervention survey.

Table 2

Follow-up Survey Participant Gender, Age Range, Emergency Service Sector, Employment Type and Length of Employment

Participant Category (*N*= 6)	*N*	% of sample
Gender		
Male	6	100
Female	-	-
Age Range		
25-34	-	-
35-44	1	16.6
45-54	3	50
55+	2	33.3
Emergency Service Sector		
Tasmania Police	4	66.6
State Emergency Services	2	33.3
Employment Type		
Professional (Salaried)	5	83.3
Volunteer	1	16.6
Length of Employment (Years)		
1-5	1	16.6
6-10	-	-
11-15	2	33.3
16-20	1	16.6
21-25	2	33.3

Materials

The baseline and follow-up surveys were administered online and consisted of the following questionnaire battery:

The Resilience Scale for Adults (*RSA;* Friborg et al., 2003): The RSA measures levels of resilience in six intrapersonal and interpersonal domains (personal strength, social competence, structured style, family cohesion and social resources). The 33 self-report items are rated on a 5-point semantic differential response scale with higher scores indicating higher levels of personal resilience. The RSA includes item statements such as "When something unforeseen happens", with answers ranging from 1 (I always find a solution) to 5 (I often feel bewildered); and "Events in my life that I cannot influence", with answers ranging from 1 (I manage to come to terms with) and 5 (are a constant source of worry/concern). Total RSA scores range from 33-165 with lower scores (33-77) indicating low resilience, and higher scores (123-165) indicating higher levels of resilience.

Reliability scores for the RSA are demonstrated to range from acceptable to good (α=0.76 to 0.87; Friborg et al., 2003) for each subscale and good to excellent (α=0.84 to α=0.90) for the total scale (Hjemdal et al., 2011; Capanna et al., 2015).

Personal Health Questionnaire Depression Scale – 8-item (*PHQ-8;* Kroenke et al., 2009a): The PHQ-8 is a measure of depressive symptoms. Eight self-report items are rated on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*nearly every day*). The PHQ-8 is based on DSM-IV criteria of depressive disorders (Thombs et al., 2014). Individual item scores are summed to obtain a total score between 0 to 24. Scores in the

PHQ-8 can be interpreted as ranging from no significant depressive symptoms (0-4) to severe depressive symptoms (20-24).

The PHQ-8 has been shown to have good reliability, with Cronbach's alphas ranging from 0.82 (Pressler et al., 2011) to 0.90 (Kroenke et al., 2009b) in outpatient and primary care patient samples. Convergent validity has been demonstrated as acceptable (r=0.616) with the Hamilton Depression Rating Scale (Shin et al., 2019).

Generalised Anxiety Disorder 7-item Scale (*GAD-7;* Spitzer et al., 2006): The GAD-7 measures psychological and physical symptoms of anxiety. The scale comprises 7 self-report items rated on a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*nearly every day*). Total scores range from 0 to 21 with scores exceeding 5, 10 and 15 indicating mild, moderate and severe anxiety symptom levels, respectively.

Internal consistency has been demonstrated to range from good (α=0.89) in the general population (Löwe et al., 2008) to excellent (α=0.92) in a primary care clinic setting (Spitzer et al., 2006).

The Job Satisfaction Survey (*JSS;* Spector, 1985): The JSS was used to measure the extent to which emergency service professionals were satisfied with their current occupation. In accordance with the research of Paton and colleagues (2008), the JSS was used as a proxy measure of resilience. The scale comprises 36 self-report items rated on a 6-point Likert scale ranging from 1 (*very much disagree*) to 6 (*very much agree)*. The JSS items are designed to measure nine domains of job satisfaction: satisfaction with pay, fringe benefits, promotional opportunities, contingent rewards, co-workers, supervision, nature of work, work conditions and communication. Total scale scores range from 36-216 with scores of 36-108, 108-144 and 144-216 indicating job

dissatisfaction, ambivalence and satisfaction, respectively (Spector, 1985). Similarly, scores on the JSS subscales range from 4-24 and are also indicative of dissatisfaction (4-12), ambivalence (12-16) and dissatisfaction (16-24) for specific domains.

Internal consistency and test-retest reliability of the JSS have been demonstrated as excellent (α=0.86, ICC=0.71; Spector, 1985). Acceptable convergent validity was established in a comparison with the Job Descriptive Index (*r*=0.61- 0.80; van Saane et al., 2003).

The Mindfulness Attention Awareness Scale (*MAAS;* Carlson & Brown, 2005) is a measure of capacity for mindfulness. The scale comprises 15 self-report items rated on a 6-point Likert scale ranging from 1 (*almost always*) to 6 (*almost never*). The sum of individual item scores are averaged to obtain a total score. Higher scores on the MAAS indicate greater trait mindfulness (i.e. attention and awareness of present events and occurrences). The MAAS has been demonstrated to have good reliability (α=0.89; MacKillop & Anderson, 2007) and test-retest reliability (*r*=0.81; Brown & Ryan, 2003).

Life Events Checklist for DSM-5 (LEC-5; Weathers et al., 2013). The LEC-5 was used to quantify participant experiences with potentially traumatic events (PTEs) in their professional roles and personal lives. Higher scores indicate greater exposure to PTEs. These questions were included in the battery to examine whether exposure to traumatic events influences the efficacy of mental training programs. These items were asked last in the survey battery to avoid the possibility of reflection on these events influencing scores on other scales (i.e. anxiety, depression).

Demographic variables. Information regarding participant age, gender, occupational role and occupational type (professional, volunteer) were also obtained at the beginning of the survey battery.

Feedback of Mental Training. At the conclusion of the follow-up survey, participants were asked to give feedback regarding their experiences with the mental training program (SRT or mindfulness; Appendix F). The training feedback questionnaire covered two domains: satisfaction with the mental training and ability to complete the training. There was also the option to provide qualitative feedback.

Table 3 displays the distribution of questionnaires across the baseline and follow-up survey.

Table 3

Inclusion of Questionnaires Across Baseline and Follow-up Surveys

Questionnaire	Baseline	Follow-up
RSA (Resilience)	*	*
PHQ-8 (Depression)	*	*
GAD-7 (Anxiety)	*	*
JSS (Job Satisfaction)	*	*
MAAS (Mindfulness)	*	*
LEC-5 (PTE Exposure)	*	*
Demographic variables	*	
Feedback of mental training		*

Mindfulness Training: Exercises were taken with permission from the Living Well (2019) organisation website. The training sessions were audio-based and involved

core mindfulness strategies including breathing exercises, focusing attention on surroundings and cognitive defusion. The exercises used in the present study were: *Mindfulness of Breathing*; *Mindfulness of Difficult Thoughts; Body Scan*; *Mindfulness of Thoughts; Alternate Nostril Breathing; Thoughts, Body Sensations and Emotions; and Mindfulness of Physical Discomfort*. Exercises varied in length from 4 minutes to 14 minutes (M_{time} = 8:10). Excluding the first week of training, two exercises were assigned per week for participants to engage with over the four-week period.

Self-Reflection Training. The self-reflective questionnaire developed by Crane and colleagues (2019) included 7 items that encompassed the necessary steps of effective self-reflection outlined by Crane and Boga (2017; Appendix G). Participants completed this questionnaire on an online platform (LimeSurvey). The same questionnaire was administered over the training period, in order for participants to engage in self-reflection of their personal coping strategies over time in different situations.

Procedure

Participants were randomly assigned to one of two mental training groups (mindfulness, self-reflection). Both participant groups were provided with a web link (via the study advertisement) giving them access to the baseline questionnaire comprised of the scales discussed above (*RSA, JSS, PHQ-8, GAD-7, LEC-5, MAAS, demographic questions*). An email address was obtained from participants and weekly training sessions were emailed to each group at the start of the week. Participants were informed they could complete the training at their leisure in an environment free of distraction or interruption (see Figure 3 for study timeline).

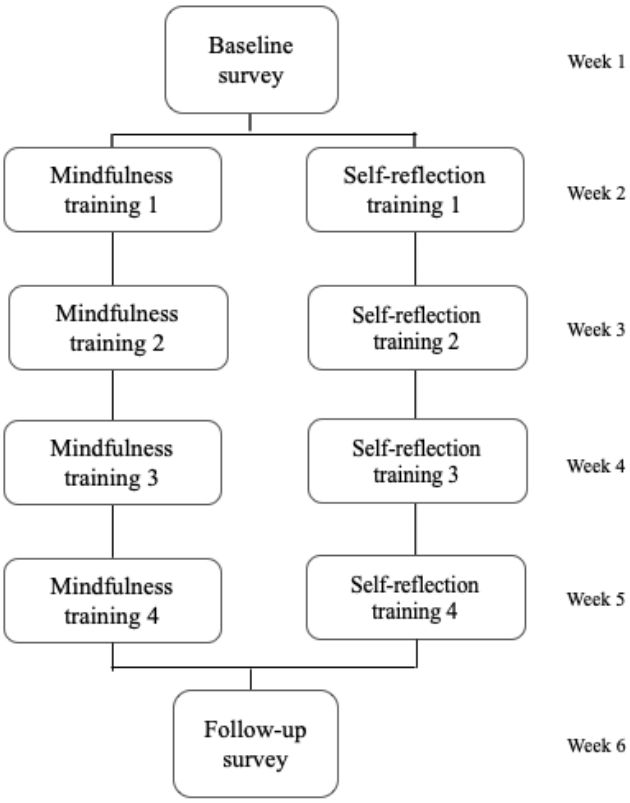

Figure 3. Study timeline for each mental training group (mindfulness and SRT)

In the week following the fourth and final mental training session, participants completed a follow-up questionnaire similar to the baseline questionnaire with the exception of the demographic questionnaire (replaced with the mental training feedback questionnaire). Upon completion of the follow-up questionnaire, participants had the opportunity to enter the draw to receive one of the six $50 Coles/Myer gift vouchers.

Design and Analysis

This study employed a pre-post design to compare outcome variables (resilience, depression, anxiety, job satisfaction, mindfulness capacity) at baseline and following the mental training intervention. Independent samples *t*-tests were conducted to examine any

differences between occupation (police, state emergency service), profession type (professional, volunteer) and training type (mindfulness, SRT) for all variables. A mixed ANOVA was conducted to examine the effect of the two mental trainings on predictors of salutogenic and pathogenic outcomes, examining both within- and between-group effects of time and training type. Exposure to traumatic events (as measured by the *LEC*-5) was intended to be used as a covariate to examine whether effects of mental training differed with PTE exposure levels. Multiple regression analyses were employed to examine the predictive power of training engagement (number of trainings completed, amount of daily practice) on resilience, depression and anxiety. Thematic analysis of the qualitative feedback of mental training questionnaire was also employed to examine the feasibility and acceptability of the mental training programs for first responder participants.

Results

Data Screening

Prior to conducting statistical analyses, the data was examined for outliers and assessed for normality. There were no outliers in the data set, as assessed by inspection of box plots. A Shapiro-Wilks Test of normality identified deviations from normal distribution of the data. These deviations were not unexpected due to the particularly small sample size at both baseline (N=18) and follow-up (N=6). As the lack of normality was not due to any extreme outliers, a decision was made to continue conducting the analyses due to ANOVAs capabilities of being robust to deviations from normality (Field, 2018).

Levene's *F*-tests revealed several unequal variances in the data set. Transformation of this data was attempted but unsuccessful in improving assumption checks and therefore a decision was made to retain them as untransformed variables and interpret the results accordingly. As our within-subject factor (time) had only two levels (pre, post mental training), sphericity was not tested.

Regression analyses revealed several violations of statistical assumptions. Due to the small sample size, scatterplots were uninterpretable and therefore assumptions of linearity and homoscedasticity were not assessed. Examination of Cook's Distance statistics identified several influential cases. Again, due to the small sample size these violations were not unsurprising. In addition, these cases were likely a reflection of the diverse experiences faced by the first responder population and is was unlikely the data would conform to assumptions of normality. Therefore, a decision was made to retain all data points and continue with the regression analysis. Regression analysis assumptions met included no evidence of multicollinearity (as assessed by all VIF values exceeding 0.1). Normality was difficult to interpret (as assessed by examination of a P-P plot) due to sample size but appeared to be met. Due to assumption violations, analyses were considered exploratory to determine the relationship between multiple variables that cannot be determined by bivariate correlation analysis.

Descriptive statistics and *t*-tests

Independent samples *t*-tests were conducted to compare scores on outcome variables of police personnel with those of SES personnel at baseline (Table 4). Bonferroni corrections were applied to analyses to control for family-wise error rates. Results revealed no significant differences between police and SES personnel on any of

the measured outcome variables and therefore all participants were treated as one occupational group for the remainder of analyses. Additional *t*-tests were conducted and revealed no significant differences between professional and volunteer personnel There were no sex differences found on any of the outcome variables.

Table 4

Descriptive Statistics and T-test Results of Variables for Police and SES Personnel at Baseline

	Police (*N*=12)		SES (*N*=6)			
Variable	*M*	*SD*	*M*	*SD*	*t* value	*p* value
RSA (Resilience)	125.67	22.90	128.33	10.48	-0.27	.79
Personal Strength	37.92	8.50	39.50	4.23	-0.43	.68
Structured Style	14.75	2.83	15.50	3.94	-0.47	.65
Social Competence	18.92	5.38	19.83	4.22	-0.36	.72
Family Cohesion	24.33	5.33	22.67	2.42	0.72	.48
Social Resources	29.75	5.31	32.50	3.76	-0.44	.66
PHQ-8 (Depression)	5.33	5.07	6.50	4.59	-0.47	.64
GAD-7 (Anxiety)	6.58	6.71	5.83	3.66	0.25	.80
JSS (Job Satisfaction)	143.33	20.24	139.33	21.11	0.39	.70
Pay	14.33	4.46	12.50	4.93	0.79	.43
Promotion	14.17	4.30	13.50	1.97	0.36	.73
Supervision	18.75	5.33	17.17	2.86	0.67	.51
Fringe Benefits	13.08	3.40	14.83	3.60	-1.01	.33
Contingent Rewards	14.25	3.49	14.50	4.89	-0.12	.90
Operating Conditions	13.33	3.26	14.33	4.76	-0.53	.60
Co-workers	18.08	2.94	17.0	5.22	0.57	.58
Nature of Work	19.08	3.37	18.33	3.50	0.44	.66
Communication	18.25	2.93	17.17	2.86	0.74	.47
MAAS (Mindfulness)	59.75	18.46	59.67	13.05	0.009	.99

The means, standards deviations and Cronbach's alphas for each variable are displayed in Table 5. Scores on these measures indicate high resilience in first responder participants. Mean scores for depression and anxiety measures indicate mild depressive and anxiety symptom levels. In addition, both depression and anxiety scores were significantly greater than those of the general population as identified through single-sample *t*-tests with Cohen's d statistics indicating a moderate effect for both variables, $t(18) = 2.2$, $p = .04$, $d = 0.5$ (depression; Kroenke et al., 2009a), $t(18) = 2.4$, $p = .02$, $d = 0.5$ (anxiety; Löwe et al., 2008). Overall job satisfaction scores were indicative of ambivalent satisfaction with current occupation with subscale scores ranging from ambivalent to satisfied. Mean scores for the MAAS were in the middle range of possible scores, indicating personnel possessed moderate mindfulness capacity.

Table 5

Descriptive Statistics and Cronbach's Alphas for Variables

Scale/Subscale	Items	Mean	SD	α
RSA	33	125	19.8	.93
Personal Strength	10	38	7.31	.87
Structured Style	4	15	3.06	.69
Social Competence	6	19.1	4.81	.76
Family Cohesion	6	23.3	4.87	.86
Social Resources	7	29.7	4.99	.85
PHQ-8	8	5.63	4.69	.89
GAD-7	7	6.11	5.69	.95
JSS	36	142	19.5	.86
Pay	4	13.7	4.43	.79
Promotion	4	14	3.54	.58
Supervision	4	18.2	4.49	.79
Fringe Benefits	4	13.6	3.39	.58
Contingent Rewards	4	14.6	3.91	.66
Operating Conditions	4	13.8	3.65	.58
Co-workers	4	17.7	3.62	.71
Nature of Work	4	18.7	3.26	.73
Communication	4	17.9	2.79	.53
MAAS	15	60.4	16.2	.94
LEC-5	17	66.3	42.2	[a]

α = Cronbach's alpha
[a] = No Cronbach's alpha for LEC-5 (checklist measure)
RSA= Resilience Scale for Adults
PHQ-8=Patient Health Questionnaire – 8 item
GAD-7=Generalised Anxiety Disorder Scale – 7 item
JSS = Job Satisfaction Scale
MAAS = Mindfulness Attention Awareness Scale
LEC-5 = Life Events Checklist for DSM-5 (Minimum Number of Events Exposed)

Preliminary Analysis

A repeated measures mixed ANOVA was conducted and examined for within-group differences in first responder resilience, depression, anxiety, job satisfaction and mindfulness (as measured by the *RSA, PHQ-8, GAD-7, JSS* and *MAAS*, respectively) before and after completion of the mental training. Results (presented in Table 6) revealed a significant main effect of time on depression, F (1, 4) = 7.92, p = .048, partial η^2 = .664, suggesting any mental training had a significant effect on self-reported depression symptoms. Average depression scores were reduced from 5.72 (SD = 4.81) at baseline to 1.83 (SD = 2.23) at follow-up. No other significant effect of time was found on any of the other outcome variables. As there was no main effects or interaction found on participant resilience, potentially traumatic event exposure (as quantified by the LEC-5) was not used a covariate to examine whether effects of training differed with professional experience (i.e. number of events exposed to), as was planned.

Table 6

Main Effect of Time on Outcome Variables (Regardless of Training Type)

Variable	*F*	Sig	Partial η^2
RSA (Resilience)	4.47	.102	.528
Personal strength	6.09	.069	.604
Structured style	1.33	.313	.250
Social competence	4.42	.103	.525
Family cohesion	0.02	.902	.004
Social resources	0.27	.629	.064
PHQ-8 (Depression)	7.92	.048	.664
GAD-7 (Anxiety)	3.53	.133	.469
JSS (Job satisfaction)	7.15	.056	.641
MAAS (Mindfulness)	0.11	.760	.026

Also examined were the between-groups differences of training type (mindfulness and SRT) on resilience, depression, anxiety, job satisfaction and mindfulness. There was no significant main effect of training type on any of the outcome variables measured (Table 7).

Table 7

Main Effect of Training Type on Outcome Variables (Regardless of Time)

Variable	*F*	Sig	Partial η^2
RSA (Resilience)	1.25	.325	.239
Personal strength	1.11	.351	.218
Structured style	0.41	.557	.093
Social competence	4.11	.113	.507
Family cohesion	0.26	.637	.061
Social resources	1.69	.264	.297
PHQ-8 (Depression)	2.01	.230	.334
GAD-7 (Anxiety)	2.64	.179	.398
JSS (Job satisfaction)	3.18	.149	.443
MAAS (Mindfulness)	6.06	.069	.603

Additionally, there was no significant interaction found between time and training type for any of the outcome variables (Table 8).

Table 8

Interaction Effect of Time and Training Type on Outcome Variables

Variable	*F*	Sig	Partial η^2
RSA (Resilience)	1.05	.362	.209
Personal strength	0.04	.859	.009
Structured style	0.15	.720	.036
Social competence	3.16	.150	.442
Family cohesion	0.43	.547	.098
Social resources	0.00	1.00	.000
PHQ-8 (Depression)	0.19	.684	.046
GAD-7 (Anxiety)	0.18	.693	.043
JSS (Job satisfaction)	0.55	.449	.121
MAAS (Mindfulness)	0.96	.381	.195

Regression Analysis

Separate multiple regression analyses were conducted to examine the predictive power of training engagement (as indicated by number of trainings completed and amount of daily practice) on first responder wellbeing to examine the dose-response relationship for each training type. Number of trainings completed and amount of daily practice did not statistically significantly predict resilience, F (2, 3) = 0.64, p = .584, R^2 = .30 (Table 9), depression F (2, 3) = 0.52, p = .641, R^2 = .26 (Table 10), anxiety F (2, 3) = 0.16, p = .855, R^2 = .10 (Table 11), or mindfulness, F (2, 3) = 4.02, p = .142, R^2 = .73 (Table 12).

Table 9

Predictors of Resilience

	B	SEb	B	*t*	*p*	95% CI Lower	95% CI Upper
Trainings completed	-1.667	8.651	-.099	-.193	.860	-29.197	25.864
Daily practice	-18.00	18.351	-.506	-.981	.399	-76.401	40.401

Table 10

Predictors of Depression

	B	SEb	B	*t*	*p*	95% CI Lower	95% CI Upper
Trainings completed	-1.095	1.082	-.538	-1.012	.386	-29.197	25.864
Daily practice	.571	2.296	.132	.249	.820	-76.401	40.401

Table 11

Predictors of Anxiety

	B	SEb	B	*t*	*p*	95% CI Lower	95% CI Upper
Trainings completed	-0.048	1.972	-.014	-.024	.982	-6.323	6.228
Daily practice	2.286	4.183	-.320	.546	.623	-11.026	15.598

Table 12

Predictors of Mindfulness

	B	SEb	B	*t*	*p*	95% CI Lower	95% CI Upper
Trainings completed	1.286	4.691	.160	.274	.802	-13.643	16.214
Daily practice	-5.714	9.951	-.336	-.574	.606	-37.382	25.954

Analysis of Mental Training Feedback

T-Tests

Independent samples *t*-tests were conducted to compare feedback scores between the two mental training groups (Table 13). These feedback scores covered both satisfaction with training and ability to complete the prescribed training sessions. Bonferroni corrections were applied to analyses to control for family-wise error rates. Results revealed no significant differences between the two training groups in overall training satisfaction, $t(4) = -1.14$, $p = .318$, or ability to complete the trainings, $t(4) = 0.303$, $p = .777$. Overall, first responders reported moderate satisfaction with the mental training. Participants also reported a moderate inability to complete the mental training. However, the small sample size at follow-up (mindfulness training $N=4$; SRT $N=2$) should be noted when interpreting these results, with no deviation in scores between some participants suggesting limited generalisability of findings to larger cohorts.

Table 13

Participant Feedback of Mental Training

Variable	Mindfulness (*N*=4)		SRT (*N*=2)			
	M	*SD*	*M*	*SD*	*t* value	*p* value
Training satisfaction (total)	13.25	7.89	20.0	0.00	-1.14	.318
Enjoyable	2.50	1.73	4.0	0.00	-1.15	.313
Helpful	2.50	1.73	4.0	0.00	-1.15	.313
Would continue in the future	2.50	1.73	4.0	0.00	-1.15	.313
Comfortable completing the training	3.25	1.50	4.0	0.00	-0.67	.541
Felt enhanced wellbeing	2.50	1.73	4.0	0.00	-1.15	.313
Inability to complete (total)	10.0	3.65	9.0	4.24	0.30	.777
Did not have time	3.75	1.26	3.50	2.12	0.19	.859
Sessions took too long	3.25	1.50	2.0	0.00	1.11	.329
It took a long time before I could focus on the training	3.50	1.73	3.50	2.12	0.00	1.00

Qualitative Analysis

Thematic analysis of qualitative feedback given by participants regarding the experience of mental training revealed one core theme of affective state, with three subthemes detailing the nature of affective experience: irritation, displeasure, and relaxation (examples of feedback displayed in Table 14). Common to both training types (mindfulness and SRT) was feedback expressing irritation with the training. For some participants in the mindfulness group, this was attributed to the exercise content and

narrator's voice. Feedback from the SRT group included frustration with receiving the same questionnaire each week, describing the training as becoming monotonous. One participant suggested the questionnaire be tailored to their specific occupation to avoid seeming generic.

A reoccurring theme in the SRT feedback specifically was the training was unpleasant to complete. Participants reported the training to be confronting, and to elicit emotions they did not want to think about or feel. One participant highlighted their desire to avoid thinking about work-related issues at home.

One participant gave positive feedback, reporting the mindfulness training as being relaxing.

Table 14

Qualitative Feedback of Mental Training Examples

Theme/s of feedback	Feedback excerpt
Irritation	"If anything, it was rather irritating"
	"The voice of the narrator (for me) became annoying and somewhat patronising"
	"The same questions every week became monotonous"
	"It felt really generic and I just kind of wrote it off after that"
Displeasure	"I don't want to have to think about the stuff I have to deal with at work"
	"I didn't expect it to be so confronting"
	"I wanted to be able to get rid of feelings, not think about them"
Relaxation	"I have found the content from the weekly emails to be beneficial in allowing me to relax"

Discussion

The present study aimed to examine the effect of two forms of brief, self-directed mental training programs on salutogenic outcomes (resilience) and pathogenic outcomes (depression and anxiety) in two cohorts of first responders. Finally, the study aimed to

explore the dose-response relationship between mental training engagement and effects on resilience, depression and anxiety.

Resilience

The first hypothesis of the present study, that there would be an increase in resilience scores following completion of the mental training programs, was not supported. There was no significant main effect of time or training type on resilience or components of resilience (measured by the RSA total score and subscales; see Tables 6 and 7). There was also no significant interaction of time and training type on resilience or components of resilience. These results indicate that changes in salutogenic effects were not dependant on participating in mental training, nor the type of mental training completed.

This finding is inconsistent with the findings of Kaplan and colleagues (2017), who observed a significant increase in resilience in a sample of police officers and firefighters following completion of a mindfulness training program. The researchers attributed this increase to an increase in mindfulness, with evidence of partial mediation occurring. However, the present study did not observe an increase in mindfulness in either mental training group following training completion (see Tables 6 and 7). These differences between the two studies could be attributed to the modality of the mindfulness training program. The present study delivered a fully online and self-directed program to be completed in the participants own time, while Kaplan and colleagues (2017) delivered a face-to-face training program during work hours. It is possible that competing demands outside work hours negatively impacted participant's ability to fully engage with the program compared to having training implemented in a

face-to-face format. This notion echoes that of Gillingham and Molinari (2012) who found participants of online courses are more likely to get distracted and multitask, thereby reducing the effectiveness of this type of modality in achieving desired learning outcomes and maintaining participant engagement.

Todkill and Powell (2013) found adherence to online interventions was motivated by salience of benefits experienced by participants. It is possible the online mindfulness training did not elicit salient effects of wellbeing and therefore participants dropped out of the study before they had completed the full four weeks of training, as reflected in the attrition rate of participants who did not progress to complete the follow-up survey (66%).

Todkill and Powell (2013) also identified that online programs often fail to tailor the program to the intended consumers, resulting in reduced adherence. Kaplan and colleagues (2017) reported altering the content of mindfulness training to be more tailored to first responders and relevant to their occupational experiences. The present study did not alter the mindfulness training or SRT content to be relevant to a first responder demographic which may have increased participant attrition before the mental training benefits were able to become salient. Graber and colleagues (2015) identified the need for programs to be tailored to the intended population, particularly high-risk populations such as first responders. Selecting demographic-appropriate RTPs ensures the mechanisms targeted and skills developed are compatible with those that are both feasible and desirable for the target population. This is supported by the qualitative results displayed in Table 15. One participant reported that the training felt generic and would be better if it was designed solely for police. Implementing personalised greetings

including participant names and personal feedback could also increase program adherence and therefore effects of mental training on salutogenic outcomes such as resilience.

Length of training program could also contribute to the discrepancy of the present study's findings and those of Kaplan and colleagues (2017). The mindfulness training program employed by Kaplan and colleagues (2017) included 20 hours of training over an 8-week period, which was far more extensive than the present study's training. It is possible the present study's mindfulness training of less than two hours over a four-week period was not sufficient for participants to develop emotion regulation and acceptance which have both been demonstrated to foster resilience (Pillay & Eagle, 2019). However, feedback from mental training indicated participants did not have enough time to complete the present study's brief training, let alone an extensive 20-hour program. Participants from both mental training groups reported an average score of 3.5 (out of a maximum 5) when rating their difficulty completing the training programs due to not having enough time. Given that engagement and quality of mindfulness training is suggested to be more predictive than quantity of practice hours (Del Re et al., 2012), it is likely a lack of engagement inhibited participants from experiencing salutogenic outcomes such as resilience.

As SRT is in its infancy being implemented as an RTP, there are no published empirical studies using resilience as an outcome measure and thus the results cannot be compared to those of another study. However, it is possible that the potential barriers for the mindfulness training group (length of training, insufficiently tailored to participants) also inhibited the SRT group from demonstrating an observable increase in resilience. In

addition, SRT requires metacognitive skills that may take longer than the allocated training period to develop and therefore were not able to have an effect on resilience.

A resistance towards reflection on distressing events could also have contributed to the results of the present study. Qualitative feedback of mental training revealed reluctance by some participants to think about PTEs they had experienced. One participant stated, “I don’t want to have to think about the stuff I have to deal with at work”. As the training program is based on reflection of past adversity, reluctance to do so would likely inhibit the development of salutogenic effects posited to occur as a result of SRT.

Depression and Anxiety

The second hypothesis of the present study, that there would be a reduction in pathogenic outcomes (i.e. depression and anxiety) following completion of the mental training programs, was partially supported. There was no significant main or interaction effects of time or training type on anxiety. These results suggest the completion of mental training had no effect on participant self-reported anxiety symptoms, as measured by the GAD-7, regardless of which training type was completed. This finding is inconsistent with those of Boettcher and colleagues (2014) who found a decrease in anxiety symptoms following an internet-based mindfulness training program. Similarly, Crane and colleagues (2019) found a decrease in anxiety symptoms following completion of the same SRT program that was implemented in the present study.

A significant main effect of time on depression was found with post-training scores significantly lower than pre-training scores. This suggests symptoms of depression, as measured by the Patient Health Questionnaire 8-item, were reduced

following completion of mental training. However, there was no significant main effect of training type on depression, suggesting that completing mental training is more important than the specific type of training in reducing depressive symptoms. This conclusion was further supported by no significant interaction of time and training type being found. This finding supports the research of Boettcher and colleagues (2014), who found reduction in symptoms of depression following a mindfulness training program, as well as those of Crane and colleagues (2019), who found a reduction in symptoms of depression following SRT. These findings suggest that mental training programs can be effective in targeting the cognitive and affective symptoms of depression.

When considering why the mental training had an effect on symptoms of depression but not anxiety, it is useful to consider the different mechanisms underpinning each psychological state. A potential underlying factor targeted by mindfulness and SRT mental training is cognitive fusion of thoughts and emotions. Blackledge (2007) emphasises the role of cognitive defusion in mindfulness-based psychotherapies to illuminate thoughts as transient and minimise perseveration of negative cognitions, thereby reducing depressive symptoms. Additionally, there is also a demonstrated link between behavioural repertoire expansion (such as that trained in SRT) and cognitive defusion (Blackledge, 2007). It is possible the SRT effectively expanded the behavioural repertoire of participants sufficiently to achieve cognitive diffusion and reduce their post-training depression scores.

Although cognitive fusion is common to both depression and anxiety, it is plausible that the physiological mechanisms of anxiety could function as an additional barrier to cognitive defusion. Is it possible that effective reduction in the physiological

mechanisms that perpetuate anxiety (e.g. increased heart and respiratory rate) require longer and more immersive training than the brief time period prescribed in the present study, and may benefit from being delivered in a format where direct modelling can occur. Greater engagement in mental training, in conjunction with physiological management strategies, could be required to target these symptoms. If physiological symptoms persist, they can activate anxious cognitions and perpetuate distress in this regard thereby undermining effectiveness (or rate of change) of mental training programs.

It is also possible the content of the training, particularly the SRT, increased or sustained personnel anxiety. As reflected in the qualitative training feedback (see Table 14), participants were confronted by the training and reported dissatisfaction with having to think about distressing events. Crane and colleagues (2019) commented an increase in anxiety is likely to result from the SRT as a consequence of recalling and reflecting on distressing events. It is possible the inability to escape distressing cognitions while engaging in the training elicited physiological symptoms which perpetuate distressing thoughts and further physiological arousal in a cyclical manner. The possibility that depression scores were reduced by an unmeasured confounding variable should also be considered, although what this variable may have been cannot be hypothesised based on the data available. Related is the potential for participants to report reduced depression following mental training due to a placebo effect, however this is improbable due to the negative feedback of the training programs.

Dose-response relationship between training and effects on salutogenic and pathogenic outcomes

The third hypothesis, that engagement with mental training would predict resilience, depression, anxiety, and mindfulness was not supported. Engagement in mental training includes both quantity and quality of the completed training. Results of a regression analysis found that neither the number of training sessions completed, nor amount of daily practice, predicted resilience, depression, anxiety or mindfulness scores (see Table 9-12). Therefore, there is no evidence in the current study to support a relationship between both practice quality or quantity and treatment outcomes. These results mimic those of Carmody and Baer's (2009) meta-analysis in which they found no relationship between formal training time and effects of mindfulness training on various measures of psychological distress.

It is possible the brief mental training time did not reach the minimum threshold to elicit positive benefits (i.e. increases in resilience, reduction in depression and anxiety). There is a large discrepancy in the literature regarding sufficient length of mindfulness training programs to elicit such benefits (Mellor et al., 2016) and very little empirical research examining the effect of mindfulness programs with treatment doses as low as the present study. McCreary (2019) highlighted the diversity of training programs available (in terms of frequency, duration, intensity, and modality) that are being implemented in an organisational context which limits conclusions that can be made regarding efficacy of mindfulness programs and dose-response relationships. There is no empirical literature designating the necessary length of SRT, due to the novelty of the training in a resilience training context. However, Crane and colleagues

(2019) found an effect of SRT implemented for a similar amount of time as the present study (75 minutes over 5 weeks) and saw a reduction in pathogenic outcomes. It is possible this relates to participant engagement and the quality of SRT practice, rather than the quantity. This argument is supported by Del Re and colleagues (2012) who emphasise the importance of practice quality, rather than quantity, in cultivating results from mindfulness interventions. As such, the degree of engagement in the mental training practice contributes to the quality of future practice and outcomes to a greater degree than the quantity alone.

As Crane and colleagues (2019) used a sample of military cadets, participation in the SRT was likely given in an opt-out context. The culture of obedience that characterises the military is likely to have increased engagement in the training compared to a first-responder contexts in which greater autonomy can be exercised. Additionally, the SRT was implemented during training hours by army psychologists of a superior rank to the cadets. Therefore, the discrepancy between the results with the current study could be due to personnel in the present study participating in a voluntary context and completing the training outside of work hours, thereby impacting their ability to fully engage with the content. Engagement quality was unable to be determined from the mental training feedback data in the present study.

A further consideration regarding the non-significant findings within the current study relates to the number of PTEs experienced by participants within the current study. As Harvey and colleagues (2016) identify, PTE exposure is linked to poorer psychological outcomes. The mean score for participant PTE exposure within the current study was a minimum of 66 exposures (Table 5). This number is substantially

higher than the global average of 3.3 PTE exposures (Benjet et al., 2016). It is possible that high exposure to PTEs perpetuate pathogenic outcomes that are more resistant to intervention and therefore the brief training was not sufficient. The dose-response relationship of PTE exposure and pathogenic outcomes should be considered and controlled for in future research.

Implications

Acknowledging there were only six participants in the follow-up mindfulness group and only two participants in the SRT group, it is possible the results of the present study are spurious or the result of a self-selection bias of participants. As such, results may not be generalisable to the broader first responder population. However, if these results were to be replicated in a larger sample, they may inform future proactive salutogenic intervention programs that are both feasible and acceptable for the needs of first responders.

Taken as a whole, results of the current study suggest brief mental training could be beneficial in reducing depression in first responder personnel. Participant feedback indicates that although they elected to participate, suggesting a desire to engage in the training programs, they were unable to do so due to other time and role commitments. The limited time participants managed to spend engaging in training was sufficient to have an effect on depression but not resilience or anxiety. In addition to feasibility, the mental training had limited acceptability from the participant sample, as reflected in qualitative feedback.

In shaping future interventions, several key considerations should be integrated. Personnel recognise the need for programs that assist preservation of mental health

(BeyondBlue, 2018) but the systematic barriers (i.e. practical, cultural) are preventing engagement in such programs. One way to overcome these barriers is to implement mental training in work hours. This assists first responders in balancing their mental health care with other commitments as well as increasing perceived organisational support for the mental health of personnel, which has been identified as a key contributor to occupational wellbeing (BeyondBlue, 2018). Institutionalising mental health intervention programs as a core and ongoing part of occupational training also has benefits in reducing stigma and increasing participant engagement in programs. For example, the Tasmanian Fire Service allocates two hours per rostered shift for personnel to engage in professional development activities (Anonymous, Personal Communication). If a portion of this time was prescribed to complete training that supports mental health, it could contribute to a reduction of stigma and increase in proactive self-care in the organisation.

In addition, tailoring the content of training to be relevant to the targeted cohort has been demonstrated to increase initial engagement and adherence to programs (Kaplan et al., 2017). Grupe and colleagues (2019) report there are very few evidence-based interventions tailored to the specific needs of first responders. Therefore, this is an important consideration for future research.

Identifying the dose required to elicit benefits of wellbeing interventions is vital for selecting programs that are appropriate for the intended demographic. No consensus exists regarding what the sufficient dose is for mindfulness or SRT and the present study has been unable to clarify this. It is possible the reduction of depression in the present study was due to dose, but this cannot be determined and therefore more research is

needed to examine mental training at different dose levels. Carmody and Baer (2009) argue that brief interventions remain an important health resource for those who are unable to complete extensive training. Identifying the sufficient dose of mental training required to induce salutogenic benefits and inhibit pathogenic outcomes has important implications for prevention and intervention program development. If effects of training are predicted by training engagement quality (as opposed to quantity), brief interventions remain a viable option for populations such as first responders who face substantial time constraints.

Limitations and future research

It is important the findings of the present study are interpreted in consideration of the study's limitations. The participant sample present several issues. The small sample size would have impacted the ability of analyses to accurately detect effects and differences between and within participant groups. Smith and colleagues (2002) identify small sample size as the primary cause of reduced power and increase in risk of Type 2 errors.

Despite invitation to all Tasmania first responder organisations, the participant pool encompassed only police and SES personnel. Therefore, the findings may not be generalizable to other first responder groups (i.e. ambulance, fire). These issues reflect difficulties with participant recruitment and research collaboration with external organisations. Related is the issue of potential self-selection bias. It is possible that only those participants who take an active role in preserving their mental health or those without symptoms of extreme distress would self-select into the study due to the nature of the research topic. These personnel may have different levels of the measured

variables and therefore diminished the generalizability of findings. Additionally, given the climate of mental health discourse in the emergency services, it is possible participants responded with a social desirability bias to create a healthy worker effect (Shah, 2009). Online, anonymous surveys were employed to minimise this risk and increase participant engagement. Future research should take self-selection and cultural barriers to participation such as stigma into consideration when conducting research with these populations.

There were also several study design and methodological limitations that should be considered. Due to recruitment issues, a control group was not able to be established for the current study. Future research should employ a no-treatment control group to allow comparisons of salutogenic and pathogenic outcomes of participants engaged in different types of mental training and the control group.

Reliance on self-report measures has been criticised as an unreliable data collection method due to potential for biases and other issues such as misinterpretation of questions (Wilson, 2002). However, as Baumeister and colleagues (2007) argue, self-report measures highlight nuanced information of latent constructs and other unobservable variables that may not be obtainable by other means. Future research would benefit from incorporating both self-report and other objective experimental measures to gather a complete representation of first responder experiences.

Due to time restrictions, follow-up surveys were only administered at one time point. Future research should measure outcome variables at several follow-up time points (e.g. three months, six months) to track wellbeing trajectories of first responders over time. A longer research time period would also allow for increased engagement

with mental training programs to explore dose-response relationships between the two training types and effects.

Conclusions

Research has consistently demonstrated elevated distress and poorer psychological outcomes in first responders. Due to the inevitable exposure of first responders to potentially traumatic events and other occupational stressors, identifying effective strategies that foster salutogenic outcomes is paramount to preserve health and wellbeing in these occupational roles. The present study implemented mental training programs adapted to overcome the practical and cultural barriers to mental health promotion faced by first responders and found brief doses of mindfulness and self-reflection training significantly reduced symptoms of depression and may provide promise in this regard. The results of this research contribute to the limited literature examining mental health in first responders and may inform future development of acceptable and feasible prevention and intervention programs to promote the health and wellbeing of first responders.

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Appendices

Appendix A

Ethics Approval Letter

03 May 2019

Dr Kimberley Norris
C/- University of Tasmania

Sent via email

Dear Dr Norris

REF NO: H0018034
TITLE: Can mindfulness training increase resilience to potentially traumatic events in first responders?

We are pleased to advise that the Tasmania Social Sciences Human Research Ethics Committee approved the above project on 03 May 2019.

Please ensure that all investigators involved with this project have cited the approved versions of the documents listed within this letter and use only these versions in conducting this research project.

This approval constitutes ethical clearance by the Tasmania Social Sciences HREC. The decision and authority to commence the associated research may be dependent on factors beyond the remit of the ethics review process. For example, your research may need ethics clearance from other organisations or review by your research governance coordinator or Head of Department. It is your responsibility to find out if the approvals of other bodies or authorities are required. It is recommended that the proposed research should not commence until you have satisfied these requirements.

In accordance with the National Statement on Ethical Conduct in Human Research, it is the responsibility of institutions and researchers to be aware of both general and specific legal requirements, wherever relevant. If researchers are uncertain they should seek legal advice to confirm that their proposed research is in compliant with the relevant laws. University of Tasmania researchers may seek legal advice from Legal Services at the University.

All committees operating under the Human Research Ethics Committee (Tasmania) Network are registered and required to comply with the *National Statement on the Ethical Conduct in Human Research* (NHMRC 2007 updated 2018).

Therefore, the Chief Investigator's responsibility is to ensure that:

(1) All investigators are aware of the terms of approval, and that the research is conducted in compliance with the HREC approved protocol or project description.

(2) Modifications to the protocol do not proceed until **approval** is obtained in writing from the HREC. This includes, but is not limited to, amendments that:
(i) are proposed or undertaken in order to eliminate immediate risks to participants;

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(ii) may increase the risks to participants;
(iii) significantly affect the conduct of the research; or
(iv) involve changes to investigator involvement with the project.

Please note that all requests for changes to approved documents must include a version number and date when submitted for review by the HREC.

(3) Reports are provided to the HREC on the progress of the research and any safety reports or monitoring requirements as indicated in NHMRC guidance. Researchers should notify the HREC immediately of any serious or unexpected adverse effects on participants.

(4) The HREC is informed as soon as possible of any new safety information, from other published or unpublished research, that may have an impact on the continued ethical acceptability of the research or that may indicate the need for modification of the project.

(5) All research participants must be provided with the current Participant Information Sheet and Consent Form, unless otherwise approved by the Committee.

(6) This study has approval for four years contingent upon annual review. A *Progress Report* is to be provided on the anniversary date of your approval. Your first report is due 03 May 2020**,** and you will be sent a courtesy reminder closer to this due date. Ethical approval for this project will lapse if a Progress Report is not submitted in the time frame provided

(7) A *Final Report* and a copy of the published material, either in full or abstract, must be provided at the end of the project.

(8) The HREC is advised of any complaints received or ethical issues that arise during the course of the project.

(9) The HREC is advised promptly of the emergence of circumstances where a court, law enforcement agency or regulator seeks to compel the release of findings or results. Researchers must develop a strategy for addressing this and seek advice from the HREC.

Should you have any queries please do not hesitate to contact me on (03) 6226 6254 or via email ss.ethics@utas.edu.au.

Yours sincerely

Jude Vienna-Hallam
Executive Officer I Social Sciences

Human Research Ethics Committee (Tasmania) Network
Research Ethics and Integrity Unit
Office of Research Services

Private Bag 1
Hobart Tasmania
7001
Australia

T +61 3 6226 6254
E ss.ethics@utas.edu.au
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Appendix B

Tasmanian Institute of Law Enforcement Studies Approval Letter

TASMANIA POLICE
Office Of The Commissioner

GPO Box 308 HOBART TAS 7001
Phone (03) 6230 2111
Email tasmania.police@police.tas.gov.au

Our ref: A19/108368

4 June 2019

Dr Kimberley Norris
University of Tasmania
Private Bag 30
Hobart, Tasmania 7001

E-mail: Kimberley.Norris@utas.edu.au

Dear Dr Norris

TILES/DPFEM RESEARCH APPLICATION: CAN MINDFULNESS TRAINING INCREASE RESILIENCE TO POTENTIALLY TRAUMATIC EVENTS IN FIRST RESPONDERS?

Thank you for your interest in conducting research with the Department of Police, Fire and Emergency Management (DPFEM), Tasmania.

I am pleased to advise that the application has now been approved subject to the following conditions:

- Please arrange the research through Learning and Development Services. Staff members from that area will provide assistance in identifying experienced officers to facilitate the completion of your research project. The contact person is Inspector Tony Kay who can be contacted on telephone +61 3 6173 2034 or via email: Tony.Kay@police.tas.gov.au.

- I ask that once completed, the final research results are provided via email to learning.development@police.tas.gov.au and tiles.admin@utas.edu.au (should you not be able to provide your research results via email please contact learning.development@police.tas.gov.au for a postal address).

- A presentation on the findings is made to key staff within DPFEM. Inspector Kay will contact you if your presentation is required.

Should you have any queries, please liaise with Inspector Kay.

Yours sincerely

J Higgins
Assistant Commissioner
Specialist Support

CC **Director, TILES (email)**
Executive Officer, TILES (e-mail)

Appendix C

Tasmanian State Emergency Service Shoptalk Newsletter

Issue 12/2019, 23 August 2019

from the desk of

the Director
Andrew Lea

SES Values:

- *Professionalism*
- *Respect*
- *Commitment*
- *Integrity*

INVITATION TO PARTICIPATE IN RESEARCH – USING MENTAL HEALTH TRAINING TO FOSTER RESILIENCE IN EMERGENCY SERVICES PERSONNEL

You are invited to participate in research being conducted by Dr. Kimberley Norris, Dr. Crystal Meehan and Caitlin Connolly in the Division of Psychology at the University of Tasmania. This research has been approved by the Department of Police, Fire and Emergency Management, and the Tasmanian Social Sciences Human Research Ethics Committee (HREC) (approval H0018034).

The study aims to examine whether various methods of mental training foster resilience in Tasmanian emergency service professionals. As exposure to a variety of stressful events is inherent in the emergency services profession, it is essential for personnel to have the necessary internal resources in order to minimize psychological strain. To date, there is very limited knowledge of how to effectively prevent negative impacts of trauma and stress exposure and enhance mental wellbeing in these professions.

It is appreciated that staff and volunteers in the emergency services work under demanding conditions and therefore may not have ample spare time to complete traditional resilience training programs (which commonly require 2-3 hours of time commitment per week). Researchers are trialing mental training programs with much short time commitments (around 20 minutes per week) to examine if these are more suitable.

Participation will involve completing an on-line survey (about 30 min) at the beginning and end of the study. You will also be asked to participate in an on-line mental training program (15 min per week for four weeks).

If you are willing to participate in this important research, follow the prompts via the following link: **https://tinyurl.com/yxjgvbxc**

Please note this study is completely anonymous. You do not have to give your name and your responses will not be identifiable or able to be traced back to you.

What is the purpose of this study?
This study aims to examine the efficacy of mindfulness on levels of resilience to potentially traumatic events in Tasmanian emergency service personnel.

Why is this research important? What are the benefits?
The results of this research could increase understanding of methods that foster resilience and promote wellbeing following traumatic events. This would inform appropriate interventions and research into supporting the needs of emergency service professionals.

The study will provide participants with training designed to enhance personal resilience. Strengthening resilience has a variety of benefits including increased mental and physical health, the ability to overcome challenges and quickly recover from adversities faced in their personal and professional lives.

What will the study involve?
Participants will complete a 30-minute survey examining job satisfaction, resilience, mood, mindfulness awareness, organizational attitudes and exposure to traumatic events.

They will then complete four short (15 minutes) mental training sessions over a four-week period. These sessions will include exercises such as mental focus, coping skill reflection and reaction awareness. These will be fully online and available to complete in their own time.

Participants will then be asked to complete a brief follow-up survey. Following the completion of the final survey, participants are invited to enter the draw to win one of six $50 Coles/Myer gift vouchers.

Will the study be anonymous?
Yes. Participants will not be required to give their name and the responses collected from the surveys will not be identifiable or able to be traced back to them. The data will instead be stored alongside a randomized code. An email address is required to send the weblink for the mental training and follow-up survey, but this will be automatically sent by the secure survey program being used, not by researchers. The researchers will not know whether you have or have not participated in the study, nor will your employer.

More information?
If you have any questions or concerns about this study, please contact the following people:

- Kimberley Norris, Chief Investigator via Kimberley.Norris@utas.edu.au.
- Crystal Meehan, Co-Investigator via Crystal.Meehan@utas.edu.au

Appendix D

Study advertisement

UNIVERSITY of TASMANIA

Using Mental Training to Foster Resilience in Emergency Service Personnel

Are you currently working or volunteering for Ambulance Tasmania, the Tasmania Fire Service, Tasmania Police or the State Emergency Service?

How can you help?

We want to examine whether short-term mental training can foster resilience and reduce the impacts of occupational exposure to trauma in first responders. Participation will involve completing an online survey (30 minutes' completion at the beginning and completion of the study) and participating in an online mental training program (15 minutes per week for four weeks).

At present we have limited knowledge of the wellbeing of the emergency services population.
Your participation will be completely anonymous and will help us increase understanding of how to enhance the overall health and wellbeing of first responders.

This study has approval from the Tasmanian Institute of Law Enforcement Studies (TILES), the Tasmania Social Sciences Human Research Ethics Committee (HREC) (approval H0018034) and the Department of Police, Fire and Emergency Management.

Interested?

- Follow this link: **https://tinyurl.com/yxjgvbxc** to register to participate
- Participants can enter the draw to win one of six $50 Coles/Myer gift cards

Appendix E

Participant Information Sheet

Private Bag 30 Hobart
Tasmania 7001 Australia
Phone: (03) 6226 7199

SCHOOL OF MEDICINE, PSYCHOLOGY

The Efficacy of Mental Training Programs on Resilience in Emergency Service Personnel

Information Sheet for Participants

Invitation

You are invited to participate in a research study examining the efficacy of mindfulness training on resilience in Tasmanian emergency service professionals. This study is being conducted by Dr Kimberley Norris, Dr Crystal Meehan and Caitlin Connolly within the Division of Psychology at the University of Tasmania. Dr Kimberley Norris is the Chief Investigator on this project and Dr Crystal Meehan is Co-Investigating this research. Caitlin Connolly is completing this research as part of her Honours degree in Psychology.

What is the purpose of this study?

The purpose of this study is to examine whether various forms of mental training affects resilience levels in first responders – that is, people working in emergency services such as Tasmania Police, Tasmanian Ambulance Service, Tasmanian Fire Service and Tasmanian State Emergency Service. The results of this research could increase understanding of methods that effectively foster resilience and promote wellbeing following traumatic events and inform appropriate interventions tailored to supporting the needs of emergency service professionals.

Why have I been invited to participate?

You are eligible to participate in this study because you reside in Australia, are over 18 years of age, and are working, or training to work, as a professional in Tasmania Police, Ambulance Tasmania, Tasmania Fire Service or Tasmania State Emergency Service and have been doing so for at least the past year. Please note that your involvement is voluntary; there will be no consequences if you decide not to participate.

What will I be asked to do?

You will be asked to complete an initial online survey examining resilience, job satisfaction, depression symptoms, anxiety symptoms, mindfulness capacity and exposure to traumatic events in your professional career. The survey will also ask that you provide some general demographic information about yourself, and this is expected to take approximately 30-45 minutes to complete.

Following the completion of this survey, you will be invited to the next phase of research. This will involve a 10-15-minute mental training session approximately one week after you complete the survey. This training will be fully online and requires no additional materials. Please ensure you complete this training in an environment free of distractions or interruptions. You are welcome to complete the training at any point throughout the day.

You will be asked to complete three more mental training sessions (once per week). Again, these can be completed at your own leisure in an environment free of distraction or interruptions.

Approximately one week after the final training session, you will be asked to complete a final follow-up survey that examines the same experiences that were explored in the first survey. This survey is also expected to take approximately 30-45 minutes to complete.

By completing and submitting the online survey you are indicating you consent for us to use your data for research purposes.

Following the completion of the final survey, you will be invited to enter the draw to receive one of six $50 Coles/Myer gift vouchers. Please follow the link at the end of the final survey to enter your details if you wish to enter this prize draw.

Are there any possible benefits from participation in this study?

This study will provide you with training designed to enhance personal resilience. Strengthening resilience has a variety of benefits that extend beyond this study and can positively impact your professional and personal life. Benefits of increased resilience include the ability to overcome challenging situations, quickly recover from adversities and improve your mental and physical health. Upon completion of the study, you will also have the opportunity to go into the draw to receive one of six $50 Coles/Myer gift vouchers.

Are there any possible risks from participation in this study?

The survey will include several questions relating to past exposure to traumatic situations and events whilst undertaking occupational duties in the emergency service sector. We recognize the potential for these questions to cause some discomfort. If you do experience discomfort while completing the survey or the mental training, please remember that your participation is voluntary and you are able to withdraw from the study at any point in time.

Should you experience discomfort during or after the survey or mental training sessions due to the nature of their content, please contact either of the following organisations:

- Lifeline Australia provide support and advice via telephone on 13 11 14. In addition, they have a web-chat service located at https://www.lifeline.org.au/get-help/online-services/crisis-chat. The latter service occurs 7 days a week (7:00pm-12:00am).
- Beyond Blue also provide support and advice via telephone on 1300 22 4636. Their web-chat service occurs 7 days a week (3:00pm-12:00am) and can be located at https://www.beyondblue.org.au/get-support/get-immediate-support
- You are also welcome to contact the Chief Investigator, Dr Kimberley Norris, via the contact information below.

What if I change my mind during or after the study?

You are free to withdraw from this study at any time and can do so without providing any explanation. If you wish to withdraw from the study, please do not submit any further surveys associated with this research project.
Please note that your data will be removed from the study should you choose to withdraw prior to completing the survey. However, as all data is non-identifiable, it will not be possible to identify and remove your data once the final survey has been submitted.

What will happen to the information when this study is over?

Data collected as part of the online survey will be kept on password-protected computers at the University of Tasmania. Only authorised study personnel will have access to this data. The results of this study will be published upon completion. No participant will be identifiable in the publication of results. You will also remain anonymous should the data from this research be used in future studies. All electronic data from the present study will be destroyed five years after the date of first publication.

How will the results of the study be published?

The results of this study will be published in an academic journal. A summary of the research findings will be made available via the social media sites on which the study was originally advertised (Facebook), as well as on the Division of Psychology's webpage. Individualised feedback will not be possible due to the data having been non-identifiable. If you wish to discuss the results of the present study in further detail, please contact the Chief Investigator via email (Kimberley.Norris@utas.edu.au).

What if I have questions about this study?

If you have any questions or concerns about this study, please contact the following people:

- Kimberley Norris, Chief Investigator via Kimberley.Norris@utas.edu.au.
- Crystal Meehan, Co-Investigator via Crystal.Meehan@utas.edu.au
- Caitlin Connolly, Student Investigator via Cc24@utas.edu.au

This study has been approved by the Tasmanian Social Sciences Human Research Ethics Committee. If you have concerns or complaints about the conduct of this study, please contact the Executive Officer of the HREC (Tasmania) Network on +61 3 6226 6254 or email human.ethics@utas.edu.au. The Executive Officer is the person nominated to receive complaints from research participants. Please quote ethics reference number H0018034.

Thank you for your participation in this study.

Appendix F

Participant Feedback of Mental Training

1. Which type of mental training did you complete?

☐ Reflection training
☐ Mindfulness training

2. Did you practice any of the exercises from the training in your daily life?

☐ Never
☐ Rarely
☐ Sometimes
☐ Often
☐ Very often

3. Please indicate the extent to which you agree with the following statements?

	Strongly disagree			Strongly agree
I enjoyed the training sessions	☐	☐	☐	☐
I found the training sessions helpful	☐	☐	☐	☐
I didn't have time to complete the training sessions	☐	☐	☐	☐
It took a long time before I could focus on the training exercises	☐	☐	☐	☐
I would consider continuing this type of training in my future	☐	☐	☐	☐
I felt comfortable completing the training sessions	☐	☐	☐	☐
I found the training sessions to be too long	☐	☐	☐	☐
I feel like the training enhanced my wellbeing	☐	☐	☐	☐

4. Please add any additional comments you wish to make regarding the mental training program you practiced

Appendix G

Self-reflection Training Questionnaire

1. Describe one of the more difficult events that you have experienced during the previous week. In your response consider: what were you thinking; how you behaved; how you felt physically and emotionally; or how your emotions, thinking, and physical feelings changed or influenced you.

2. When envisioning yourself coping under pressure, what are some of the characteristics or behaviours that you could have? NOTE: These are characteristics you aspire to, not necessarily ones that you already demonstrate.

3. What did you do to minimize the stress or maximize your performance in response to this event?

4. What were you trying to achieve during this situation? This could be something related to a goal within the task or a personal goal (e.g. improve my ability to maintain focus under pressure).

5. To what degree were these strategies effective in allowing you to achieve your desired outcomes?

   1 (not at all) ☐ ☐ ☐ ☐ ☐ ☐ ☐ 7 (completely)

6. What useful knowledge, skills or abilities could be gained or developed from this experience?

7. How would you change or improve your strategy in the future to help you cope better when dealing with a similar challenge, or situation?